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TWO PHILIPPINE MOSQUITOES.

By C. S. LUDLOW.

Among the new undertakings begun in the Philippines under the shelter of the Army, is the study of some of the insects connected with the transmission of diseases, especially of mosquitoes; and in the little while that this work has been under way interesting points have developed in connection with what may be called "insular variation."

This, so far as has been observed, usually occurs so as to throw the new variety between two established species, and, in many cases, is so marked as to raise a question as to identity of species, or even where the species may be granted, is enough to prove very trying in classifying these insects. For instance, what in other respects is *Anopheles rossii* Giles has "curiously mottled" legs, not described for the type, but resembling those of *A. costalis* Loew. What should be *A. annularis* van der Wulp, which Theobald places as a subspecies under *A. sinensis* Wied., evidently stands between that and his subspecies *pseudopictus* Grassi, for while it agrees to the former in most points, it agrees with *pseudopictus* in having three joints of the palpi banded white and the tip white, in having the third small light spot on the subcosta (besides the two on the costa), and in the thoracic lines, there being no spots or change of color between the scales of the cephalic and caudal end of the thorax as in *annularis*; while it differs from either in having no apical light band on the third tarsal joint of the hind legs. Such differences point, of course, toward breaking down these subspecies, and seem to make it desirable to keep all at one very variable form, with certainly nothing more definite than varieties under it.

Stegomyia fasciata Fabr., is common at certain times, all over the Island where collections have been made, but these periods are by no means coincident. Both the varieties *mosquito* Desv., and *luciensis* Theo., are frequently found, and a variety equivalent to *luciensis*, *i. e.*, with black tip on the apex of the last tarsal joint of the hind legs, has been found under *S. scutellaris* Walker.

Culex fatigans Wied., shows remarkable variation in wing venation, the stem of the first fork cell being at times almost as long as one half the length of the cell.

New species must, of necessity, arise where variations are so marked, and of the earliest to be recorded, those described below, the first found in the hill district of Abra, a distinctly mountainous province, full of rugged scenery, and the second from Bulacan, one of the most malarial parts of Luzon, will be of some interest.

Anopheles philippinensis, sp. nov.

Female.—Head very dark brown, with white and creamy (yellowish) scales scattered on top, and more thickly toward the front, long white tuft in front, a few yellowish scales on the sides, and very dark forked scales with fimbriated tops on the occiput; antennæ golden brown, some white scales and some brown at the base with lighter tips, verticels white, pubescence white, first joint basally brown but white as apex; eyes dark brown or black, with very narrow white rim; palpi golden brown, some scales apparently darker tipped, the last joint white and a narrow white band at apex of each of the three preceding joints, a few white scales at the base; proboscis brown, not so dark as the head but darker than the antennæ; white or yellowish tip.

Thorax very dark brown (both it and the head are almost black), with scattered white, flat and yellowish curved scales, no design apparent, cephalad the white scales are much longer; scutellum dark brown in the middle and at each end with a lighter spot between on which are a few white scales; metanotum dark brown; pleuræ dark brown with white marking; when denuded thorax has ashy-gray reflections with dark brown median line.

Abdomen dorsally is ashy-gray with golden-brown hairs, a narrow brown apical band on each segment, much broader on the last two segments so that they are nearly brown instead of gray.

Legs.—Coxæ brown, all white-tipped, femora dark, *i. e.*, brown-scaled dorsally, and yellowish on the ventral side, tibiæ same but a very small apical white spot on fore and mid legs; metatarsus and two following joints on the fore legs have heavy apical white bands, mid legs have faint white bands in the same positions, that on the metatarsus much the heaviest, but still not by any means so broad as on the fore legs; hind legs dorsally brown, and yellowish ventrally, much as in the other legs, but the apical half of the first tarsal and all the following joints pure white; ungues on hind legs white, on mid and fore legs brown.

Wings cream-colored spotted with brown, reminding one of *A. jamesii* Theo. Two small and four large brown spots on costa, the distal extending back through

anterior fork of second longitudinal, the next somewhat larger, through first longitudinal, the third and largest of all extends as a long spot on the costa and subcosta and three small ones on the first longitudinal, so arranged as to resemble an overturned E (**m**); the middle of these is the largest and connects with the one on the second longitudinal; the fourth spot (counting from the apex of the wing) includes the subcosta and first longitudinal, and even the two small ones include the subcosta, making all these costal spots very distinct. The apex of the costa is, however, light. There are two dark spots on anterior fork of second longitudinal, and one on the posterior fork; two small spots at the base of the third longitudinal; one on the anterior fork of the fourth longitudinal, a small one near the apex of the posterior fork, the stem is dark to posterior cross-vein, and after a small white spot, about one-half the way to the base of the vein; anterior fork of fifth has three dark spots, and there is one on the posterior near the apex, also on the stem of fifth near base of wing; there are three dark spots on the sixth longitudinal, one at the apex, one near the middle, and one near the base. A large part of the second and fourth are therefore dark, while the fifth has a large part cream-colored and still a larger proportion of the third is light. The fringe is mottled, cream and brown, nearly equally to the to the sixth longitudinal, after which it is dark. Dark spots occur in the fringe at the apex of the anterior fork of the second longitudinal and at apices of the first posterior, second posterior, third posterior, anal, auxiliary, and spurious cells (Theobald's naming) with light spots at the apices of each intervening vein. The first submarginal cell is a little longer than the second posterior, the base of the former being a little nearer the base of the wing. The posterior cross-vein is about one and one half times its length nearer the base of the wing than the mid cross-vein, and the supernumerary vein a little nearer the apex of the wing than the latter. Length (including proboscis) 5 mm.

Habitat, San José, Abra, Luzon, P. I.

Caught Sept. 1, 1901.

This mosquito is related *A. jamesii* Theo., but differs in so many points — antennæ, palpi, wings, legs — that although the differences in antennæ and wings are not great, those of the palpi and legs are so distinctive I have, after some hesitation, decided to keep it a distinct species.

Anopheles pseudobarbistrotris, sp. nov.

Female. — Head very dark brown, with some pale scales on top, spreading in front toward the sides, and partly around the eyes, tuft in front white with a few dark hairs, and dark hairs behind the eyes, otherwise covered with rather broad not deeply forked scales with fimbriated tops, the tips gray; narrow median space bare. Antennæ a lighter brown, minute white apical bands on the joints, first joint brown; verticils brown, pubescence white. Palpi very heavily scaled with dark brown (almost black) scales, many of which are ochraceous tipped, so that the effect is "rusty," joints obscure but can be seen by breaks in the scales; as long as the proboscis; last joint with brown hairs. Proboscis also heavily dark scaled, some ochraceous tipped; tip is lighter but still brown. Eyes dark brown, narrow white rim part of the way round.

Thorax dark brown with gray reflections, and narrow curved (almost hair-like) golden scales, arranged in faint *i. e.*, indefinite lines, which in some lights seem to converge so as to form a "V" from the cephalic edge the whole length of the thorax, the point caudad; pleurae brown with white markings; scutellum brown at center, paler laterad, with slender golden curved scales (such as are on the thorax) and golden bristles; metanotum brown.

Abdomen dark brown, slight grayish reflections, golden hairs; on the ventral side are a few scattered white scales and near the caudal end a bunch of rather long brown scales.

Legs.—Coxæ and trochanters all dark brown, white-tipped; femora and tibiæ all dark brown, well sprinkled with white scales, the rest of the legs a little lighter brown and in some lights giving almost "fawn-colored" reflections: all the joints of the legs and feet are white-tipped, except the last tarsal joints, and on the mid legs that is a little lighter, giving almost "clay-colored" reflections. Ungues simple and brown. Wings dark with two small yellow spots on costa, one at the apex of the wing and extending on the apices of the first longitudinal and anterior fork of second longitudinal with light spots on the fringe at apices of first longitudinal and anterior fork of second longitudinal and an included dark spot at apex of marginal cell, giving the appearance of an incomplete ring (c); the other, much smaller, on the costa at junction of the subcosta. The costal and basal portions of the wing are dark-scaled with a few white scales on the costa, subcosta, first and second longitudinal, but the third longitudinal is mostly white-scaled, and on this appear a few of the round-ended scales. The fourth longitudinal is largely dark-scaled with a few of the longer scales, but the scales are mostly of the roundish sort which are either black or white; there are dark spots at the apices of each fork and light fringe at the apex of the anterior fork. The fifth longitudinal has almost exclusively the rounder scales, and is mostly white, both as to stem and forks; dark spots at the apices of each fork, and the stem has a dark base, as have all the veins except the sixth, which is light-scaled, save two heavy dark spots, one at the apex and one about the middle of the vein. The sixth has entirely the roundish-ended scales in both black and white. The fringe is dark except for the three small places indicated, *i. e.*, at the apices of first longitudinal anterior fork of second and anterior fork of fourth longitudinal. Most of the veins, even where light, have a sprinkling of the dark among the median scales, but the larger part of the dark scales on these veins are lateral scales and lie close under the median scales, so that the wing looks much darker from the under (ventral) view, and in all the veins caudad of the third the lateral as well as the median scales are almost entirely of the "3-round-ended" sort. The wing has, however, as a whole a dark rather than light appearance, probably due to the very heavy scaling of the first two or three veins, which are mostly dark-scaled. The first submarginal cell is a little longer and narrower than the second posterior, the base of the former nearly on a line with the base of the latter, but not near the junction of the costa and subcosta; the stem of the former is about two thirds the length of the cell, and shorter than that of the second posterior, which is longer than the cell. The cross-veins are close together, the mid-vein much the longest, meeting the supernumerary at nearly a right angle (toward the apex of the wing), and the posterior cross-vein is not half its length from the mid-vein and stands at almost the same angle in the reverse direction. The halteres have black knobs, stem and base are light. Length 5 mm. (with proboscis 7 mm.).

Habitat: Hagonoy, Bulacan, Luzon, P. I.

Caught Oct. 2, 1901.

We have there one of the *sinensis* group, but evidently near *A. barbirostris* van der Wulp, the "round-ended" scales being undoubtedly the same as those described by Theobald for that species and apparently more numerous and wider spread on the wing than is indicated for that, while the differences in antennæ, palpi, wings and legs, especially the latter, are so marked as to throw it out of that species.

NOTE ON CULEX ANNULATUS.

BY C. S. LUDLOW.

Culex annulatus Schrank has been heretofore regarded as of doubtful occurrence in America. Giles "Mosquitoes or Gnats," new edition, p. 392, reports it as "doubtfully recorded from America," and in the British Museum Monograph (Theobald) in the lists for localities it stands, p. 108, under "North America and Canada," "*Culex annulatus* Meigen (?)," while on p. 334 a quotation from Osten Sacken is given, "the following note occurs on *C. annulatus* 'Mexico, Ciudad in Durango, 8,100 feet (Forrer), a single female from Ciudad agrees very well with this species.'" I am therefore glad to be able to report that a single male, in fine condition, all the markings clean cut and well defined, was taken by me in my house, March 1, 1902, Fort Baker, Marin Co., Cal. It is probable that this was a hibernating specimen as no others of any sort were found for more than six weeks afterward, and this was taken in a particularly warm and sunny room.

NOTES ON CICINDELIDÆ OF LOUISIANA.

BY CHARLES W. LENG, B.S.

These notes are mainly extracts from letters of Mr. George Coverdale, who has collected for the last two years at Vowell's Mill and at Covington. Vowell's Mill is in Natchitoches parish in the northwestern part of the state, and the vicinity is a vast stretch of uncleared woodland, the trees being principally pines and oaks. The woodland is interrupted by sandy fields planted in cotton and corn, and by